



Director's Message

Centre for Disaster Mitigation and Management (CDMM) is functioning with a vision to create a disaster risk-free India, through the confluence of the cultures of preparedness, quick response, strategic thinking, and prevention. CDMM is carrying out its activities in line with the Prime Minister's ten-point agenda for disaster risk reduction. The thrust areas of the centre are landslides, earthquakes, floods, cyclones and climate change. Research, consultancy, capacity building and support for the government in dealing with natural disasters are the primary activities of the Centre. I am happy to share the latest newsletter of CDMM, highlighting our dedicated efforts towards a resilient and safer nation.



Dr. Rama Mohan Rao P

Director, CDMM

Landslide in Sikkim's Mangan District, Northeast India, June 01st, 2025



Myanmar Earthquake, March 28th, 2025



Vision:

To create disaster risk-free India, through the confluence of the Cultures of Preparedness, Quick Response, Strategic Thinking, and Prevention.

Mission:

Destination- Disaster Risk- Free India

Consultancy and Testing

- Dr. G. P. Ganapathy conducted a comprehensive hydrogeological survey and investigation in and around Unit M4 of Malladi Drugs and Pharmaceuticals Ltd., India, across two phases: from **February 5th to May 4th, 2025**, and from **April 1st to June 30th, 2025**. The study aimed to assess the causes of waterlogging and recommend appropriate mitigation strategies. The projects were successfully executed with a combined budget of **₹5.89 Lakhs**.
- Dr. Prasanth S. carried out a condition assessment of the Roselyn Gardens Apartment Building, India, from **March 25th to April 7th, 2025**. The study focused on evaluating the structural integrity and safety of the building and was completed with a budget of **₹59 Thousand**.

List of Publications

- B. Bashaveni and R. M. R. Pannem, "Prediction of self-healing ability and compressive strength of bacterial-based self-healing concrete using direct method of ultrasonic pulse velocity test," *Nondestruct. Test. Eval.*, 2025. <https://doi.org/10.1080/10589759.2025.2482862>
- T. Koteshwaramma, K. S. Singh, and S. Nayak, "The Performance of a High-Resolution WRF Modelling System in the Simulation of Severe Tropical Cyclones over the Bay of Bengal Using the IMDAA Regional Reanalysis Dataset," *Climate*, vol. 13, no. 1, 2025. <https://doi.org/10.3390/cli13010017>
- M. S. R. and K. S. Singh, "An evaluation of cloud microphysical parameterization schemes at 1.667 km resolution in the simulation of super cyclone Amphan and extremely severe cyclonic storm Phailin," *Geomatics, Nat. Hazards Risk*, vol. 16, no. 1, 2025. <https://doi.org/10.1080/19475705.2025.2475905>
- S. Mahalingam, B. Priyadarshini, A. Asutosh, and M. Mishra, "Assessment of PM_{2.5} deposition in the human respiratory tract from a hyperlocal dataset in Bhubaneswar, India," *Air Qual. Atmos. Health*, 2025. <https://doi.org/10.1007/s11869-025-01743-2>
- Ray, G. C. Atul, S. C. Sapkota, P., Saha, S., Das, R., Rai, and M. Khandelwal, "Stability analysis and prediction of Bimslope failures using numerical modelling and hybrid meta-heuristic models," *Nat. Hazards*, 2025. <https://doi.org/10.1007/s11069-025-07164-9>
- S. Raj and R. M. R. Pannem, "Effect of graphene oxide on the microstructure and hydration characteristics of fibre reinforced cementitious composites," *Fuller. Nanotub. Carbon Nanostruct.*, 2025. <https://doi.org/10.1080/1536383X.2025.2495047>

- V. C. Doddamani, P. Rakaraddi, A. Ray, R. Rai, and M. Khandelwal, “Geotechnical Challenges in Slope Stability: Experimental Investigation of Coconut Fiber Reinforcement Under Seismic Loading,” *Iran. J. Sci. Technol. Trans. Civ. Eng.*, 2025: <https://doi.org/10.1007/s40996-025-01759-9>
- R. M. R. Pannem and B. Bashaveni, “Effect of Metakaolin on Self-healing Concrete with and Without Fly Ash Aggregates,” *Lect. Notes Civ. Eng.*, vol. 548, pp. 649–657, 2025. https://doi.org/10.1007/978-981-97-9885-8_60
- N. R. Asmitha and R. M. R. Pannem, “Performance of engineered cementitious composites under-elevated temperature--a review,” *Compos. Interfaces*, 2025. <https://doi.org/10.1080/09276440.2025.2491804>
- R. Ashok and K. S. Singh, “Role of microphysical processes in a convection permitting scale for the simulation of Arabian Sea tropical cyclones using WRF model,” *Model. Earth Syst. Environ.*, vol. 11, p. 172, 2025. <https://doi.org/10.1007/s40808-025-02351-w>
- S. Nath, V. B. Zaalishvili, and G. P. Ganapathy, “Social vulnerability and spatial adaptation: A case study of community responses to natural disasters in Silchar, Assam State, India,” *Geol. Geophys. Russ. South*, vol. 15, no. 2, 2025. <https://doi.org/10.46698/VNC.2025.67.58.001>

Events Organized

HANDS ON SESSION

One-day workshop on Damage Assessment of Reinforced Concrete (RC) Structures using Non-Destructive Testing (NDT) methods was conducted for 44 participants on **February 15th, 2025**. The workshop was coordinated by Dr. Arunava Ray and Dr. Prasanth S.



FACULTY DEVELOPMENT PROGRAM

Our centre in partnership with the Teaching Learning Centre of Excellence (TLCE), VIT Vellore, successfully organised a Faculty Development Program (FDP) titled “**Mathematical Modeling and Observations on Extreme Events**” from **March 17th to 21st, 2025**. The FDP was coordinated by Dr. Kuva Saytha Singh and Dr. Surendar M. The program attracted enthusiastic participation, with **approximately 40 faculty members** completing the FDP.

Over the course of five enriching days, participants engaged with leading experts across a range of specialized topics, including **extreme weather dynamics, coastal erosion, marine biodiversity, geospatial technologies, climate modeling, and atmospheric simulations**. The FDP offered valuable hands-on exposure to disaster modeling tools and methodologies, enhancing participants’ academic and applied competencies in the field of disaster risk science.

The distinguished panel of resource persons featured:

- **Dr. Suuba Reddy Bonthu**, National Centre for Sustainable Coastal Management
- **Prof. M.G.M. Reddy**, Andhra University
- **Dr. K. Venkataraman**, Former Director, Zoological Survey of India
- **Dr. Dipnarayan Ganguly**, National Centre for Sustainable Coastal Management
- **Dr. Sridhara Nayak**, Chief Scientist, Research and Development Centre, Japan Meteorological Corporation, JAPAN
- **Prof. Chandan Sarangi**, IIT Madras
- **Dr. Yesubabu Viswanadhapalli**, National Atmospheric Research Laboratory (NARL), ISRO

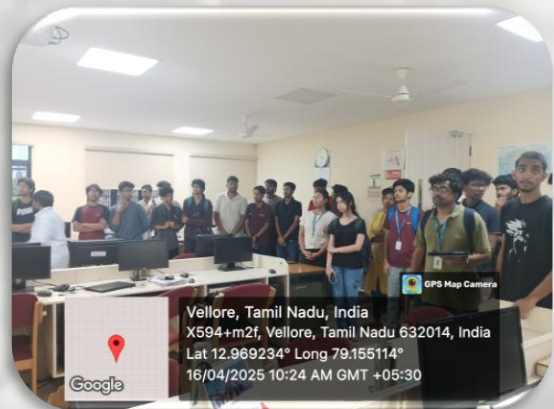


OPEN HOUSE

On **April 16th, 2025**, our centre hosted a dynamic Open House, drawing over 70 students and research scholars to explore its cutting-edge facilities and interdisciplinary research initiatives. Designed to stimulate curiosity and promote collaboration, the event spotlighted a wide spectrum of ongoing faculty-led work, including climate resilience, air pollution monitoring, slope stability analysis, remote sensing, and structural measures for disaster mitigation.

Faculty members presented advanced tools, and active research works across multiple domains, such as geospatial risk mapping, landslide hazard modeling, and infrastructure vulnerability assessment. Attendees engaged with experts in one-on-one sessions, discussing field instrumentation techniques, urban air quality strategies, and engineering solutions for resilient structures.

The Open House also catalyzed future involvement, with numerous B. Tech students initiating follow-ups to explore internship pathways and final-year projects aligned with CDMM's work. The Centre plans to continue fostering student engagement through specialized workshops, mentoring sessions, and integrated learning opportunities addressing contemporary environmental and geotechnical challenges.



WORKSHOP

Dr. Arunava Ray and Dr. Prasanth S organized a one-day workshop on “Non-Destructive Testing (NDT)” on **May 2nd, 2025**. The event was attended by 40+ participants, including 10 external students and 6 external faculty members.



FOREIGN INDUSTRY COLLABORATION

Mr. Mathew Andrew, Co-founder and CEO of Environmesta, Lisbon, Portugal, visited the centre on **May 16th, 2025**. During the visit, he engaged in discussions with faculty members to explore potential collaborative activities.



Awards and Recognition

- Dr. G.P. Ganapathy, Professor (Higher Academic Grade), was invited to represent West and South India at the One-Day Curtain Raiser Workshop on the National Capacity Building Programme for Earthquake Risk Reduction (ERR). The event was organized by the National Institute of Disaster Management (NIDM), Government of India, in collaboration with the National Disaster Management Authority (NDMA), and held at the India Habitat Centre, New Delhi, on **March 4th, 2025**.



- Dr. G.P. Ganapathy, Professor (Higher Academic Grade), has been elected as Vice Chairman of the Indian Society for Geomatics (ISG), Chennai Chapter.
- Dr. Surendar M, Associate Professor, has been elected as Vice Chairman of the IEEE Geoscience and Remote Sensing Society, Madras Chapter.
- Dr. G.P. Ganapathy, Professor (Higher Academic Grade), CDMM, was appointed to prepare the District Disaster Management Plan by the Vellore District Collector.

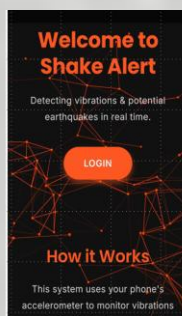
NEW ADJUNCT PROFESSOR APPOINTMENT

We are pleased to announce the appointment of **Dr. Iftekhar Ahmed** as Adjunct Professor in our centre, VIT Vellore, and he currently serves as Associate Professor and Program Convenor – Disaster Risk and Resilience at the School of Architecture and Built Environment, College of Engineering, Science and Environment, The University of Newcastle, Australia.

Summer Internship

Our centre successfully conducted a one-month summer internship program for undergraduate and postgraduate students, offering hands-on exposure to cutting-edge research in disaster science and environmental resilience. Out of 196 registered participants, 59 students completed the internship, contributing innovative solutions across a variety of scientific and technological domains. The internship sparked interdisciplinary collaboration and technical creativity. Major research highlights included:

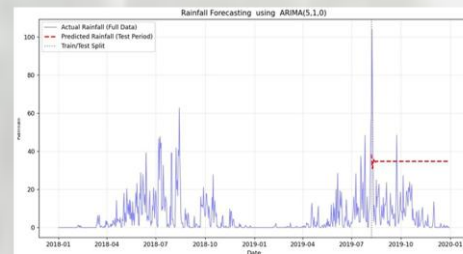
- Development of a low-cost PM_{2.5} sensor prototype.
- Analysis of PM_{2.5} exposure and associated health impacts.
- Application of time series, regression, and decision tree algorithms for rainfall prediction across Kerala, Andaman Islands, and northern India.
- ConvLSTM-based neural network trained to forecast cyclone intensity and wind speed.
- Longitudinal study of Bay of Bengal cyclone tracks and severity spanning the period from 1982 to 2024.
- Prototype developed for delivering real-time seismic alerts using mobile phone accelerometers.
- GIS- and remote sensing–based flood vulnerability assessment focused on Yamuna River overflow risks in Delhi.
- Application of high-resolution optical imagery and DTM datasets from Chandrayaan-1 and -2 missions to identify landslides on the lunar surface.



Earthquake Early Warning App



Low-cost Air Quality Sensor



ARIMA (5,1,0) is a statistical model for time series forecasting by capturing linear trends and seasonality.

Flood: Do's & Don'ts

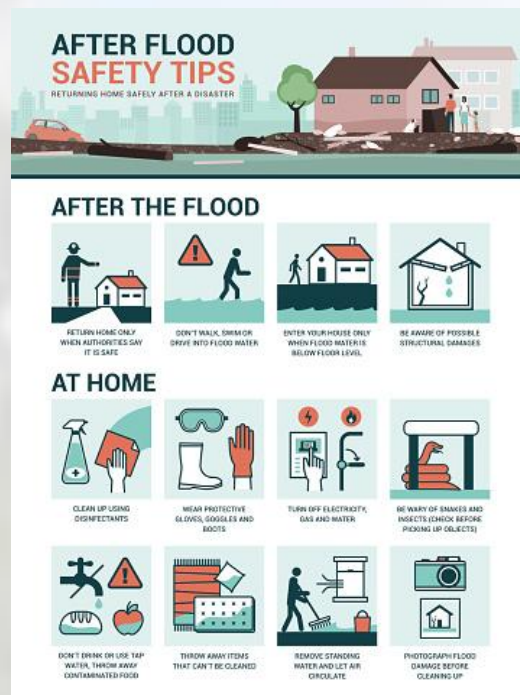
Do's

- Safe evacuation routes and ensure all family members are aware of the nearest shelter or raised platform.
- Keep an emergency kit ready, including basic medicines, sanitary items, baby food, and important documents.
- Store clean drinking water, dry food, and extra clothing in waterproof bags.
- Seal entry points with sandbags around doors, vents, and windows if necessary.
- Turn off the main power supply and move to higher floors if flooding occurs.
- Listen to official warnings on local radio or TV and follow instructions promptly.

Don'ts

- Let children or pregnant women stay hungry during flood emergencies.
- Drink unboiled or contaminated water; always prefer boiled or clean bottled water.
- Use electrical appliances that have been submerged or touched by floodwaters.
- Drive through deep or fast-moving floodwater, reverse or take a safe route.
- Allow children to play near floodwaters, as it can be unpredictable and dangerous.

(@ NIDM)



Editorial board

Dr. Rama Mohan Rao P (Professor)

Dr. Surendar M (Associate Professor)

Purneemaa R S (Research Scholar)

Ragavan P (Research Scholar)

Contact

Dr. Rama Mohan Rao P

Director – CDMM

Vellore Institute of Technology, Vellore, Tamil Nadu, India.

✉ director.cdmm@vit.ac.in

☎ 416-2202290 (office), 0416-2202281 (direct), 0416-4207035 (direct)

For more details: <https://vit.ac.in/centers/cdmm>



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